Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HOBBS OCD

OCT 24 2018

RECEIVED

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2

5. Lease Serial No.
NMNM128835

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
LEA 7 FEDERAL COM 29H

2. Name of Operator
CIMAREX ENERGY COMPANY OF CO
Contact: ARICKA EASTERLING
E-Mail: aeasterling@cimarex.com

9. API Well No.
30-025-45199-00-X1

3a. Address
600 N MARIENFELD STE 600
MIDLAND, TX 79703

3b. Phone No. (include area code)
Ph: 918.560.7060

10. Field and Pool or Exploratory Area
WILDCAT BONE SPRING

Carlsbad Field Office
OCD Hobbs

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 7 T20S R35E SESE 191FSL 1160FEL
32.580940 N Lat, 103.491806 W Lon

11. County or Parish, State
LEA COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Change to Original APD
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Cimarex respectfully requests approval change the BHL. Please see the attached C-102, directional plan and drilling plan.

Approved BHL:
330 FNL & 660 FEL

Proposed BHL:
330 FNL & 1980 FEL

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #438597 verified by the BLM Well Information System
For CIMAREX ENERGY COMPANY OF CO, sent to the Hobbs
Committed to AFMSS for processing by PRISCILLA PEREZ on 10/09/2018 (19PP0079SE)

Name *(Printed/Typed)* ARICKA EASTERLING — Title REGULATORY ANALYST

Signature (Electronic Submission) — Date 10/08/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ZOTA STEVENS — Title PETROLEUM ENGINEER — Date 10/12/2018

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office Hobbs

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
30-025-45199	97983	WC-025 G-08 S203506D; BS

4 Property Code	5 Property Name	6 Well Number
313878	LEA 7 FEDERAL COM	29H

7 OGRID No.	8 Operator Name	9 Elevation
215099	CIMAREX ENERGY CO.	3676.4'

10 Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	7	20S	35E		191	SOUTH	1160	EAST	LEA

11 Bottom Hole Location If Different From Surface

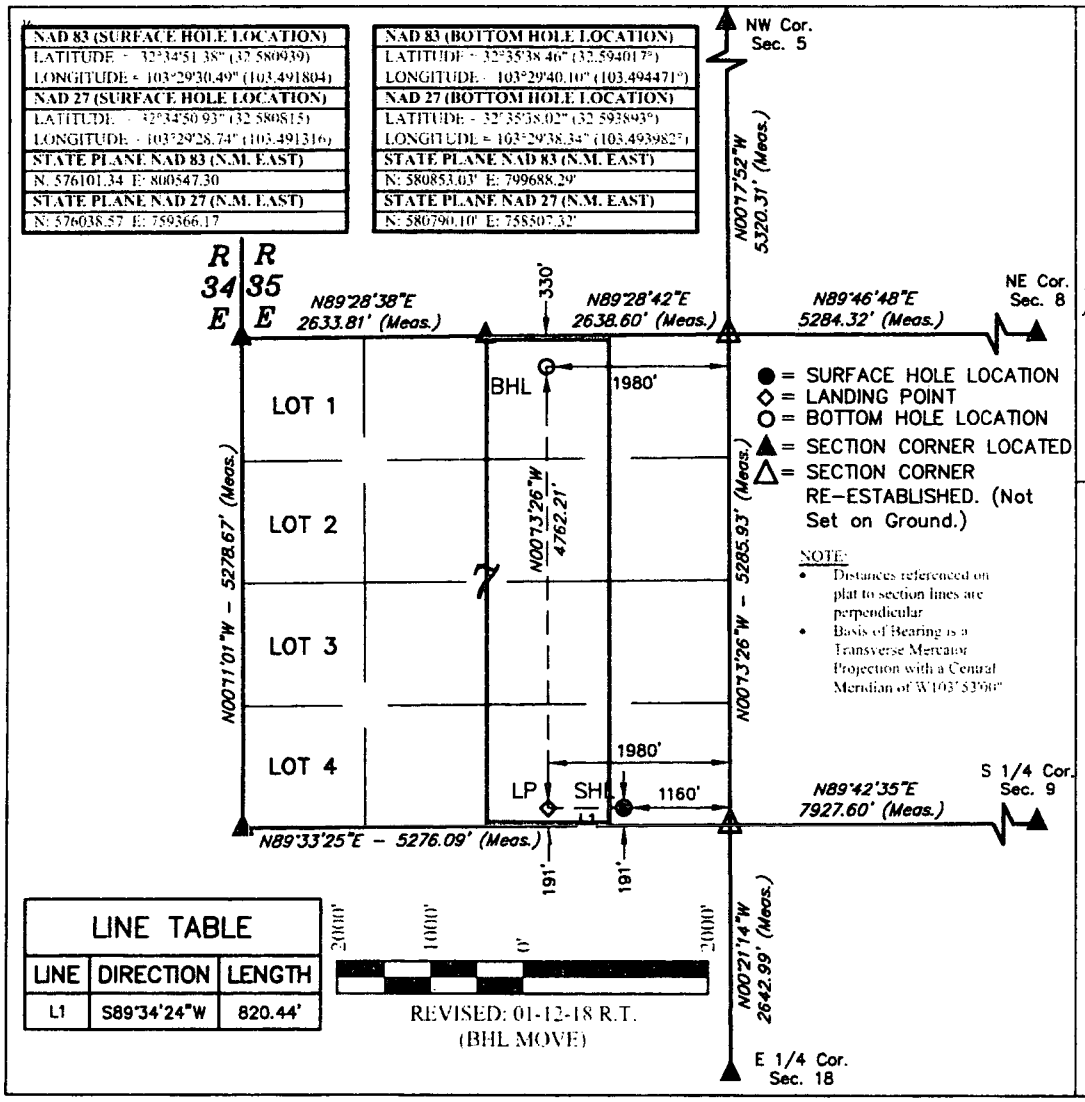
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	7	20S	35E		330	NORTH	1980	EAST	LEA

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
160			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

NAD 83 (SURFACE HOLE LOCATION)
LATITUDE = 32°34'51.38" (32.580939)
LONGITUDE = 103°29'30.49" (103.491804)
NAD 27 (SURFACE HOLE LOCATION)
LATITUDE = 32°34'50.93" (32.580815)
LONGITUDE = 103°29'28.74" (103.491316)
STATE PLANE NAD 83 (N.M. EAST)
N: 576101.34 E: 800547.30
STATE PLANE NAD 27 (N.M. EAST)
N: 576038.57 E: 759366.17

NAD 83 (BOTTOM HOLE LOCATION)
LATITUDE = 32°35'38.46" (32.594017°)
LONGITUDE = 103°29'40.10" (103.494471°)
NAD 27 (BOTTOM HOLE LOCATION)
LATITUDE = 32°35'38.02" (32.593893°)
LONGITUDE = 103°29'38.34" (103.493982°)
STATE PLANE NAD 83 (N.M. EAST)
N: 580853.03' E: 799688.29'
STATE PLANE NAD 27 (N.M. EAST)
N: 580790.10' E: 758507.32'



LINE TABLE		
LINE	DIRECTION	LENGTH
L1	S89°34'24"W	820.44'

REVISED: 01-12-18 R.T.
(BHL MOVE)

17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature — Date: 10/8/18

Aricka Easterling
Printed Name

aeasterling@cimarex.com
E-mail Address

18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

January 09, 2018
Date of Survey

Signature and Seal of Professional Surveyor

PAUL BUCHELE — NEW MEXICO — 23782 — 01-12-18 — PROFESSIONAL SURVEYOR

Certificate Number

1. Geological Formations

TVD of target 10,980
MD at TD 15,592

Pilot Hole TD N/A
Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	1730	N/A	
Top of Salt	1830	N/A	
Tansil	3380	N/A	
Capitan	4000	N/A	
Base Capitan	4740	N/A	
Delaware Sands	5740	N/A	
Brushy Canyon	8150	Hydrocarbons	
Bone Spring	8359	Hydrocarbons	
1st Bone Spring Sand	9666	Hydrocarbons	
2nd Bone Spring Sand	10293	Hydrocarbons	
3rd Bone Spring Sand	11045	Hydrocarbons	
3rd Bone Spring Target	11120	Hydrocarbons	
Wolfcamp	11160	Hydrocarbons	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1780	13-3/8"	54.50	J-55	ST&C	1.39	3.36	5.30
12 1/4	0	5720	9-5/8"	40.00	J-55	LT&C	1.32	1.30	2.27
8 3/4	0	10557	5-1/2"	17.00	L-80	LT&C	1.27	1.57	1.81
8 3/4	10557	15592	5-1/2"	17.00	L-80	BT&C	1.22	1.51	55.21
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	N
Is well within the designated 4 string boundary.	N
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	N
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	N
Is 2nd string set 100' to 600' below the base of salt?	N
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	N
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	N
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	N
Is AC Report included?	N

3. Cementing Program

Casing	# Sks	Wt. lb/gal	Yld ft3/sack	H2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	863	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	231	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	1079	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	292	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	435	10.30	3.64	22.18		Lead: Tuned Light + LCM
	1077	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS

Casing String	TOC	% Excess
Surface	0	45
Intermediate	0	51
Production	5520	17

4. Pressure Control Equipment

	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.

BOP installed and tested before drilling which hole?	Size	Min Required WP	Type		Tested To
12 1/4	13 5/8	2M	Annular	X	50% of working pressure
			Blind Ram		2M
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4	13 5/8	3M	Annular	X	50% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	X	
			Other		

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.	
X	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.	
	N	Are anchors required by manufacturer?

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 1780'	FW Spud Mud	8.30 - 8.80	30-32	N/C
1780' to 5720'	Brine Water	9.70 - 10.20	30-32	N/C
5720' to 15592'	FW/Cut Brine	8.50 - 9.00	30-32	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

	Logging, Coring and Testing
X	Will run GR/CNL fromTD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No logs are planned based on well control or offset log information.
	Drill stem test?
	Coring?

Additional Logs Planned	Interval

7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	5138 psi
Abnormal Temperature	No

	Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.
X	H2S is present
X	H2S plan is attached

8. Other Facets of Operation

9. Wellhead

A multi-bowl wellhead system will be utilized.

After running the 13-3/8" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 3000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 3000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2.

The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office.

The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 3000 psi.

The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater.

The casing string utilizing steel body pack-off will be tested to 70% of casing burst.

If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Schlumberger

Cimarex Lea 7 Federal Com 29H Rev1 RM 04Oct18 Proposal Geodetic Report

(Non-Def Plan)

Report Date:	October 04, 2018 - 09:31 AM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Cimarex	**Vertical Section Azimuth:**	359.513 ° (Grid North)
Field:	NM Lea County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Lea 7 Federal Com 29H / Cimarex Lea 7 Federal Com 29H	**TVD Reference Datum:**	RKB
Well:	Cimarex Lea 7 Federal Com 29H	**TVD Reference Elevation:**	3702.400 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	3676.400 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	6.608 °
Survey Name:	Cimarex Lea 7 Federal Com 29H Rev1 RM 04Oct18	**Total Gravity Field Strength:**	998.5063mgn (9.80665 Based)
Survey Date:	October 04, 2018	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	105.543 ° / 5580.824 ft / 5.922 / 0.508	**Total Magnetic Field Strength:**	48139.112 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	60.511 °
Location Lat / Long:	N 32° 34' 51.37975", W 103° 29' 30.49453"	**Declination Date:**	October 04, 2018
Location Grid N/E Y/X:	N 576101.340 ftUS, E 800547.300 ftUS	**Magnetic Declination Model:**	HDGM 2018
CRS Grid Convergence Angle:	0.4532 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99998604	**Grid Convergence Used:**	0.4532 °
Version / Patch:	2.10.740.0	**Total Corr Mag North->Grid North:**	6.1553 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [191' FSL, 1160' FEL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	100.00	0.00	269.28	100.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	200.00	0.00	269.28	200.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	300.00	0.00	269.28	300.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	400.00	0.00	269.28	400.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	500.00	0.00	269.28	500.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	600.00	0.00	269.28	600.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	700.00	0.00	269.28	700.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	800.00	0.00	269.28	800.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	900.00	0.00	269.28	900.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	1000.00	0.00	269.28	1000.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	1100.00	0.00	269.28	1100.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	1200.00	0.00	269.28	1200.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	1300.00	0.00	269.28	1300.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	1400.00	0.00	269.28	1400.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
Nudge 2°/100' DLS	1500.00	0.00	269.28	1500.00	0.00	0.00	0.00	0.00	576101.34	800547.30	N 32 34 51.38	W 103 29 30.49
	1600.00	2.00	269.28	1599.98	-0.01	-0.02	-1.75	2.00	576101.32	800545.56	N 32 34 51.38	W 103 29 30.51
	1700.00	4.00	269.28	1699.84	-0.03	-0.09	-6.98	2.00	576101.25	800540.32	N 32 34 51.38	W 103 29 30.58
Rustler	*1730.25*	*4.60*	*269.28*	*1730.00*	*-0.04*	*-0.12*	*-9.25*	*2.00*	*576101.22*	*800538.05*	*N 32 34 51.38*	*W 103 29 30.60*
	1800.00	6.00	269.28	1799.45	-0.06	-0.20	-15.69	2.00	576101.14	800531.61	N 32 34 51.38	W 103 29 30.68
Top of Salt	*1830.73*	*6.61*	*269.28*	*1830.00*	*-0.08*	*-0.24*	*-19.07*	*2.00*	*576101.10*	*800528.23*	*N 32 34 51.38*	*W 103 29 30.72*
Hold Nudge	1888.58	7.77	269.28	1887.38	-0.11	-0.33	-26.31	2.00	576101.01	800520.99	N 32 34 51.38	W 103 29 30.80
	1900.00	7.77	269.28	1898.70	-0.11	-0.35	-27.86	0.00	576100.99	800519.45	N 32 34 51.38	W 103 29 30.82
	2000.00	7.77	269.28	1997.79	-0.17	-0.52	-41.38	0.00	576100.82	800505.92	N 32 34 51.38	W 103 29 30.98
	2100.00	7.77	269.28	2096.87	-0.22	-0.69	-54.90	0.00	576100.65	800492.40	N 32 34 51.38	W 103 29 31.14

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	2200.00	7.77	269.28	2195.95	-0.28	-0.86	-68.42	0.00	576100.48	800478.88	N 32 34 51.38	W 103 29 31.29
	2300.00	7.77	269.28	2295.03	-0.33	-1.03	-81.94	0.00	576100.31	800465.36	N 32 34 51.38	W 103 29 31.45
	2400.00	7.77	269.28	2394.11	-0.39	-1.20	-95.46	0.00	576100.14	800451.84	N 32 34 51.38	W 103 29 31.61
	2500.00	7.77	269.28	2493.19	-0.44	-1.37	-108.98	0.00	576099.97	800438.32	N 32 34 51.37	W 103 29 31.77
	2600.00	7.77	269.28	2592.28	-0.50	-1.54	-122.50	0.00	576099.80	800424.80	N 32 34 51.37	W 103 29 31.93
	2700.00	7.77	269.28	2691.36	-0.55	-1.71	-136.02	0.00	576099.63	800411.28	N 32 34 51.37	W 103 29 32.08
	2800.00	7.77	269.28	2790.44	-0.61	-1.88	-149.55	0.00	576099.46	800397.76	N 32 34 51.37	W 103 29 32.24
	2900.00	7.77	269.28	2889.52	-0.66	-2.05	-163.07	0.00	576099.29	800384.24	N 32 34 51.37	W 103 29 32.40
	3000.00	7.77	269.28	2988.60	-0.72	-2.22	-176.59	0.00	576099.12	800370.71	N 32 34 51.37	W 103 29 32.56
	3100.00	7.77	269.28	3087.68	-0.77	-2.39	-190.11	0.00	576098.95	800357.19	N 32 34 51.37	W 103 29 32.72
	3200.00	7.77	269.28	3186.76	-0.82	-2.56	-203.63	0.00	576098.78	800343.67	N 32 34 51.37	W 103 29 32.87
	3300.00	7.77	269.28	3285.85	-0.88	-2.73	-217.15	0.00	576098.61	800330.15	N 32 34 51.37	W 103 29 33.03
	3400.00	7.77	269.28	3384.93	-0.93	-2.89	-230.67	0.00	576098.45	800316.63	N 32 34 51.37	W 103 29 33.19
	3500.00	7.77	269.28	3484.01	-0.99	-3.06	-244.19	0.00	576098.28	800303.11	N 32 34 51.37	W 103 29 33.35
Tansil	*3526.23*	*7.77*	*269.28*	*3510.00*	*-1.00*	*-3.11*	*-247.74*	*0.00*	*576098.23*	*800299.56*	*N 32 34 51.37*	*W 103 29 33.39*
	3600.00	7.77	269.28	3583.09	-1.04	-3.23	-257.72	0.00	576098.11	800289.59	N 32 34 51.37	W 103 29 33.51
	3700.00	7.77	269.28	3682.17	-1.10	-3.40	-271.24	0.00	576097.94	800276.07	N 32 34 51.37	W 103 29 33.66
	3800.00	7.77	269.28	3781.25	-1.15	-3.57	-284.76	0.00	576097.77	800262.55	N 32 34 51.37	W 103 29 33.82
	3900.00	7.77	269.28	3880.34	-1.21	-3.74	-298.28	0.00	576097.60	800249.03	N 32 34 51.37	W 103 29 33.98
	4000.00	7.77	269.28	3979.42	-1.26	-3.91	-311.80	0.00	576097.43	800235.50	N 32 34 51.37	W 103 29 34.14
Seven Rivers	*4040.96*	*7.77*	*269.28*	*4020.00*	*-1.29*	*-3.98*	*-317.34*	*0.00*	*576097.36*	*800229.97*	*N 32 34 51.37*	*W 103 29 34.20*
	4100.00	7.77	269.28	4078.50	-1.32	-4.08	-325.32	0.00	576097.26	800221.98	N 32 34 51.36	W 103 29 34.30
	4200.00	7.77	269.28	4177.58	-1.37	-4.25	-338.84	0.00	576097.09	800208.46	N 32 34 51.36	W 103 29 34.45
	4300.00	7.77	269.28	4276.66	-1.43	-4.42	-352.36	0.00	576096.92	800194.94	N 32 34 51.36	W 103 29 34.61
	4400.00	7.77	269.28	4375.74	-1.48	-4.59	-365.89	0.00	576096.75	800181.42	N 32 34 51.36	W 103 29 34.77
	4500.00	7.77	269.28	4474.82	-1.54	-4.76	-379.41	0.00	576096.58	800167.90	N 32 34 51.36	W 103 29 34.93
	4600.00	7.77	269.28	4573.91	-1.59	-4.93	-392.93	0.00	576096.41	800154.38	N 32 34 51.36	W 103 29 35.09
	4700.00	7.77	269.28	4672.99	-1.65	-5.10	-406.45	0.00	576096.24	800140.86	N 32 34 51.36	W 103 29 35.24
Queen	*4727.26*	*7.77*	*269.28*	*4700.00*	*-1.66*	*-5.15*	*-410.14*	*0.00*	*576096.19*	*800137.17*	*N 32 34 51.36*	*W 103 29 35.29*
	4800.00	7.77	269.28	4772.07	-1.70	-5.27	-419.97	0.00	576096.07	800127.34	N 32 34 51.36	W 103 29 35.40
	4900.00	7.77	269.28	4871.15	-1.76	-5.44	-433.49	0.00	576095.90	800113.82	N 32 34 51.36	W 103 29 35.56
Capitan	*4929.12*	*7.77*	*269.28*	*4900.00*	*-1.77*	*-5.49*	*-437.43*	*0.00*	*576095.85*	*800109.88*	*N 32 34 51.36*	*W 103 29 35.61*
	5000.00	7.77	269.28	4970.23	-1.81	-5.61	-447.01	0.00	576095.73	800100.29	N 32 34 51.36	W 103 29 35.72
	5100.00	7.77	269.28	5069.31	-1.86	-5.78	-460.53	0.00	576095.56	800086.77	N 32 34 51.36	W 103 29 35.88
	5200.00	7.77	269.28	5168.39	-1.92	-5.95	-474.06	0.00	576095.39	800073.25	N 32 34 51.36	W 103 29 36.03
	5300.00	7.77	269.28	5267.48	-1.97	-6.12	-487.58	0.00	576095.22	800059.73	N 32 34 51.36	W 103 29 36.19
	5400.00	7.77	269.28	5366.56	-2.03	-6.29	-501.10	0.00	576095.05	800046.21	N 32 34 51.36	W 103 29 36.35
	5500.00	7.77	269.28	5465.64	-2.08	-6.46	-514.62	0.00	576094.88	800032.69	N 32 34 51.36	W 103 29 36.51
	5600.00	7.77	269.28	5564.72	-2.14	-6.63	-528.14	0.00	576094.71	800019.17	N 32 34 51.36	W 103 29 36.67
	5700.00	7.77	269.28	5663.80	-2.19	-6.80	-541.66	0.00	576094.54	800005.65	N 32 34 51.35	W 103 29 36.83
Cherry Canyon	*5776.90*	*7.77*	*269.28*	*5740.00*	*-2.24*	*-6.93*	*-552.06*	*0.00*	*576094.41*	*799995.25*	*N 32 34 51.35*	*W 103 29 36.95*
	5800.00	7.77	269.28	5762.88	-2.25	-6.97	-555.18	0.00	576094.37	799992.13	N 32 34 51.35	W 103 29 36.98
	5900.00	7.77	269.28	5861.97	-2.30	-7.14	-568.70	0.00	576094.20	799978.61	N 32 34 51.35	W 103 29 37.14
	6000.00	7.77	269.28	5961.05	-2.36	-7.31	-582.22	0.00	576094.03	799965.08	N 32 34 51.35	W 103 29 37.30
	6100.00	7.77	269.28	6060.13	-2.41	-7.48	-595.75	0.00	576093.86	799951.56	N 32 34 51.35	W 103 29 37.46
	6200.00	7.77	269.28	6159.21	-2.47	-7.65	-609.27	0.00	576093.69	799938.04	N 32 34 51.35	W 103 29 37.62
	6300.00	7.77	269.28	6258.29	-2.52	-7.82	-622.79	0.00	576093.52	799924.52	N 32 34 51.35	W 103 29 37.77
	6400.00	7.77	269.28	6357.37	-2.58	-7.99	-636.31	0.00	576093.35	799911.00	N 32 34 51.35	W 103 29 37.93
	6500.00	7.77	269.28	6456.45	-2.63	-8.16	-649.83	0.00	576093.19	799897.48	N 32 34 51.35	W 103 29 38.09
	6600.00	7.77	269.28	6555.54	-2.69	-8.32	-663.35	0.00	576093.02	799883.96	N 32 34 51.35	W 103 29 38.25
	6700.00	7.77	269.28	6654.62	-2.74	-8.49	-676.87	0.00	576092.85	799870.44	N 32 34 51.35	W 103 29 38.41
	6800.00	7.77	269.28	6753.70	-2.80	-8.66	-690.39	0.00	576092.68	799856.92	N 32 34 51.35	W 103 29 38.56
	6900.00	7.77	269.28	6852.78	-2.85	-8.83	-703.92	0.00	576092.51	799843.40	N 32 34 51.35	W 103 29 38.72
	7000.00	7.77	269.28	6951.86	-2.91	-9.00	-717.44	0.00	576092.34	799829.87	N 32 34 51.35	W 103 29 38.88
	7100.00	7.77	269.28	7050.94	-2.96	-9.17	-730.96	0.00	576092.17	799816.35	N 32 34 51.35	W 103 29 39.04
	7200.00	7.77	269.28	7150.03	-3.01	-9.34	-744.48	0.00	576092.00	799802.83	N 32 34 51.35	W 103 29 39.20
	7300.00	7.77	269.28	7249.11	-3.07	-9.51	-758.00	0.00	576091.83	799789.31	N 32 34 51.34	W 103 29 39.35
	7400.00	7.77	269.28	7348.19	-3.12	-9.68	-771.52	0.00	576091.66	799775.79	N 32 34 51.34	W 103 29 39.51
	7500.00	7.77	269.28	7447.27	-3.18	-9.85	-785.04	0.00	576091.49	799762.27	N 32 34 51.34	W 103 29 39.67

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Drop to Vertical 2°/100' DLS	7553.22	7.77	269.28	7500.00	-3.21	-9.94	-792.24	0.00	576091.40	799755.07	N 32 34 51.34	W 103 29 39.75
	7600.00	6.84	269.28	7546.40	-3.23	-10.02	-798.19	2.00	576091.32	799749.13	N 32 34 51.34	W 103 29 39.82
	7700.00	4.84	269.28	7645.88	-3.27	-10.14	-808.35	2.00	576091.20	799738.96	N 32 34 51.34	W 103 29 39.94
	7800.00	2.84	269.28	7745.65	-3.30	-10.23	-815.04	2.00	576091.11	799732.27	N 32 34 51.34	W 103 29 40.02
	7900.00	0.84	269.28	7845.59	-3.31	-10.27	-818.24	2.00	576091.07	799729.07	N 32 34 51.34	W 103 29 40.06
Hold Vertical	7941.79	0.00	269.28	7887.38	-3.31	-10.27	-818.55	2.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	8000.00	0.00	269.28	7945.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
Brushy Canyon	*8084.41*	*0.00*	*269.28*	*8030.00*	*-3.31*	*-10.27*	*-818.55*	*0.00*	*576091.07*	*799728.76*	*N 32 34 51.34*	*W 103 29 40.06*
	8100.00	0.00	269.28	8045.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	8200.00	0.00	269.28	8145.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
Bone Spring	*8264.41*	*0.00*	*269.28*	*8210.00*	*-3.31*	*-10.27*	*-818.55*	*0.00*	*576091.07*	*799728.76*	*N 32 34 51.34*	*W 103 29 40.06*
	8300.00	0.00	269.28	8245.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	8400.00	0.00	269.28	8345.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	8500.00	0.00	269.28	8445.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	8600.00	0.00	269.28	8545.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	8700.00	0.00	269.28	8645.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	8800.00	0.00	269.28	8745.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	8900.00	0.00	269.28	8845.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	9000.00	0.00	269.28	8945.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	9100.00	0.00	269.28	9045.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	9200.00	0.00	269.28	9145.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	9300.00	0.00	269.28	9245.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	9400.00	0.00	269.28	9345.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	9500.00	0.00	269.28	9445.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	9600.00	0.00	269.28	9545.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
1st Bone Spring Sand	*9604.41*	*0.00*	*269.28*	*9550.00*	*-3.31*	*-10.27*	*-818.55*	*0.00*	*576091.07*	*799728.76*	*N 32 34 51.34*	*W 103 29 40.06*
	9700.00	0.00	269.28	9645.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	9800.00	0.00	269.28	9745.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	9900.00	0.00	269.28	9845.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	10000.00	0.00	269.28	9945.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	10100.00	0.00	269.28	10045.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
2nd Bone Spring Sand	*10184.41*	*0.00*	*269.28*	*10130.00*	*-3.31*	*-10.27*	*-818.55*	*0.00*	*576091.07*	*799728.76*	*N 32 34 51.34*	*W 103 29 40.06*
	10200.00	0.00	269.28	10145.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	10300.00	0.00	269.28	10245.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	10400.00	0.00	269.28	10345.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	10500.00	0.00	269.28	10445.59	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
KOP - Build 12°/100' DLS	10556.94	0.00	269.28	10502.54	-3.31	-10.27	-818.55	0.00	576091.07	799728.76	N 32 34 51.34	W 103 29 40.06
	10600.00	5.17	359.51	10545.53	-1.37	-8.33	-818.57	12.00	576093.01	799728.75	N 32 34 51.36	W 103 29 40.06
	10700.00	17.17	359.51	10643.46	17.96	11.00	-818.73	12.00	576112.34	799728.58	N 32 34 51.55	W 103 29 40.06
	10800.00	29.17	359.51	10735.23	57.23	50.27	-819.06	12.00	576151.60	799728.25	N 32 34 51.94	W 103 29 40.06
	10900.00	41.17	359.51	10816.83	114.72	107.75	-819.55	12.00	576209.09	799727.76	N 32 34 52.51	W 103 29 40.06
3rd Bone Spring Sand	*10992.26*	*52.24*	*359.51*	*10880.00*	*181.76*	*174.79*	*-820.12*	*12.00*	*576276.13*	*799727.19*	*N 32 34 53.17*	*W 103 29 40.06*
	11000.00	53.17	359.51	10884.69	187.92	180.95	-820.17	12.00	576282.29	799727.14	N 32 34 53.23	W 103 29 40.06
	11100.00	65.17	359.51	10935.85	273.62	266.66	-820.90	12.00	576367.99	799726.41	N 32 34 54.08	W 103 29 40.06
	11200.00	77.17	359.51	10968.07	368.10	361.13	-821.71	12.00	576462.46	799725.61	N 32 34 55.02	W 103 29 40.06
	11300.00	89.17	359.51	10979.95	467.21	460.23	-822.55	12.00	576561.56	799724.77	N 32 34 56.00	W 103 29 40.06
Landing Point	11306.94	90.00	359.51	10980.00	474.15	467.18	-822.61	12.00	576568.51	799724.71	N 32 34 56.07	W 103 29 40.06
	11400.00	90.00	359.51	10980.00	567.21	560.23	-823.40	0.00	576661.56	799723.92	N 32 34 56.99	W 103 29 40.07
	11500.00	90.00	359.51	10980.00	667.21	660.22	-824.25	0.00	576761.55	799723.07	N 32 34 57.98	W 103 29 40.07
	11600.00	90.00	359.51	10980.00	767.21	760.22	-825.10	0.00	576861.55	799722.22	N 32 34 58.97	W 103 29 40.07
	11700.00	90.00	359.51	10980.00	867.21	860.22	-825.95	0.00	576961.54	799721.37	N 32 34 59.96	W 103 29 40.07
	11800.00	90.00	359.51	10980.00	967.21	960.21	-826.80	0.00	577061.54	799720.52	N 32 35 0.94	W 103 29 40.07
	11900.00	90.00	359.51	10980.00	1067.21	1060.21	-827.65	0.00	577161.53	799719.67	N 32 35 1.93	W 103 29 40.07
	12000.00	90.00	359.51	10980.00	1167.21	1160.21	-828.50	0.00	577261.53	799718.82	N 32 35 2.92	W 103 29 40.07

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	12100.00	90.00	359.51	10980.00	1267.21	1260.20	-829.35	0.00	577361.52	799717.97	N 32 35 3.91	W 103 29 40.07
	12200.00	90.00	359.51	10980.00	1367.21	1360.20	-830.20	0.00	577461.52	799717.12	N 32 35 4.90	W 103 29 40.07
	12300.00	90.00	359.51	10980.00	1467.21	1460.19	-831.05	0.00	577561.51	799716.27	N 32 35 5.89	W 103 29 40.07
	12400.00	90.00	359.51	10980.00	1567.21	1560.19	-831.90	0.00	577661.51	799715.42	N 32 35 6.88	W 103 29 40.07
	12500.00	90.00	359.51	10980.00	1667.21	1660.19	-832.75	0.00	577761.50	799714.57	N 32 35 7.87	W 103 29 40.07
	12600.00	90.00	359.51	10980.00	1767.21	1760.18	-833.60	0.00	577861.50	799713.72	N 32 35 8.86	W 103 29 40.07
	12700.00	90.00	359.51	10980.00	1867.21	1860.18	-834.45	0.00	577961.49	799712.87	N 32 35 9.85	W 103 29 40.07
	12800.00	90.00	359.51	10980.00	1967.21	1960.18	-835.30	0.00	578061.49	799712.02	N 32 35 10.84	W 103 29 40.08
	12900.00	90.00	359.51	10980.00	2067.21	2060.17	-836.15	0.00	578161.48	799711.17	N 32 35 11.83	W 103 29 40.08
	13000.00	90.00	359.51	10980.00	2167.21	2160.17	-837.00	0.00	578261.48	799710.32	N 32 35 12.82	W 103 29 40.08
	13100.00	90.00	359.51	10980.00	2267.21	2260.17	-837.85	0.00	578361.47	799709.47	N 32 35 13.81	W 103 29 40.08
	13200.00	90.00	359.51	10980.00	2367.21	2360.16	-838.70	0.00	578461.46	799708.62	N 32 35 14.80	W 103 29 40.08
	13300.00	90.00	359.51	10980.00	2467.21	2460.16	-839.55	0.00	578561.46	799707.77	N 32 35 15.79	W 103 29 40.08
	13400.00	90.00	359.51	10980.00	2567.21	2560.16	-840.40	0.00	578661.45	799706.92	N 32 35 16.78	W 103 29 40.08
	13500.00	90.00	359.51	10980.00	2667.21	2660.15	-841.25	0.00	578761.45	799706.07	N 32 35 17.77	W 103 29 40.08
	13600.00	90.00	359.51	10980.00	2767.21	2760.15	-842.10	0.00	578861.44	799705.22	N 32 35 18.76	W 103 29 40.08
	13700.00	90.00	359.51	10980.00	2867.21	2860.14	-842.95	0.00	578961.44	799704.37	N 32 35 19.74	W 103 29 40.08
	13800.00	90.00	359.51	10980.00	2967.21	2960.14	-843.80	0.00	579061.43	799703.52	N 32 35 20.73	W 103 29 40.08
	13900.00	90.00	359.51	10980.00	3067.21	3060.14	-844.65	0.00	579161.43	799702.67	N 32 35 21.72	W 103 29 40.08
	14000.00	90.00	359.51	10980.00	3167.21	3160.13	-845.50	0.00	579261.42	799701.82	N 32 35 22.71	W 103 29 40.08
	14100.00	90.00	359.51	10980.00	3267.21	3260.13	-846.35	0.00	579361.42	799700.97	N 32 35 23.70	W 103 29 40.08
	14200.00	90.00	359.51	10980.00	3367.21	3360.13	-847.20	0.00	579461.41	799700.12	N 32 35 24.69	W 103 29 40.09
	14300.00	90.00	359.51	10980.00	3467.21	3460.12	-848.05	0.00	579561.41	799699.27	N 32 35 25.68	W 103 29 40.09
	14400.00	90.00	359.51	10980.00	3567.21	3560.12	-848.90	0.00	579661.40	799698.42	N 32 35 26.67	W 103 29 40.09
	14500.00	90.00	359.51	10980.00	3667.21	3660.12	-849.75	0.00	579761.40	799697.57	N 32 35 27.66	W 103 29 40.09
	14600.00	90.00	359.51	10980.00	3767.21	3760.11	-850.60	0.00	579861.39	799696.72	N 32 35 28.65	W 103 29 40.09
	14700.00	90.00	359.51	10980.00	3867.21	3860.11	-851.45	0.00	579961.39	799695.87	N 32 35 29.64	W 103 29 40.09
	14800.00	90.00	359.51	10980.00	3967.21	3960.10	-852.30	0.00	580061.38	799695.02	N 32 35 30.63	W 103 29 40.09
	14900.00	90.00	359.51	10980.00	4067.21	4060.10	-853.14	0.00	580161.38	799694.17	N 32 35 31.62	W 103 29 40.09
	15000.00	90.00	359.51	10980.00	4167.21	4160.10	-853.99	0.00	580261.37	799693.32	N 32 35 32.61	W 103 29 40.09
	15100.00	90.00	359.51	10980.00	4267.21	4260.09	-854.84	0.00	580361.37	799692.47	N 32 35 33.60	W 103 29 40.09
	15200.00	90.00	359.51	10980.00	4367.21	4360.09	-855.69	0.00	580461.36	799691.62	N 32 35 34.59	W 103 29 40.09
	15300.00	90.00	359.51	10980.00	4467.21	4460.09	-856.54	0.00	580561.36	799690.77	N 32 35 35.58	W 103 29 40.09
	15400.00	90.00	359.51	10980.00	4567.21	4560.08	-857.39	0.00	580661.35	799689.92	N 32 35 36.57	W 103 29 40.09
	15500.00	90.00	359.51	10980.00	4667.21	4660.08	-858.24	0.00	580761.34	799689.07	N 32 35 37.55	W 103 29 40.09
Cimarex Lea 7 Federal Com 29H - PBHL [330' FNL, 660' FEL]	15591.69	90.00	359.51	10980.00	4758.90	4751.77	-859.02	0.00	580853.03	799688.29	N 32 35 38.46	W 103 29 40.10

Survey Type: Non-Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	26.000	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS-Depth Only	Original Borehole / Cimarex Lea 7 Federal Com 29H Rev1 RM 04Oct18
	1	26.000	15591.690	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS	Original Borehole / Cimarex Lea 7 Federal Com 29H Rev1 RM

Schlumberger

Cimarex Rev 1

CIMAREX

Borehole:	Well:	Field:	Structure:
Original Borehole	Cimarex Lea 7 Federal Com 29H	NM Lea County (NAD 83)	Cimarex Lea 7 Federal Com 29H

Gravity & Magnetic Parameters

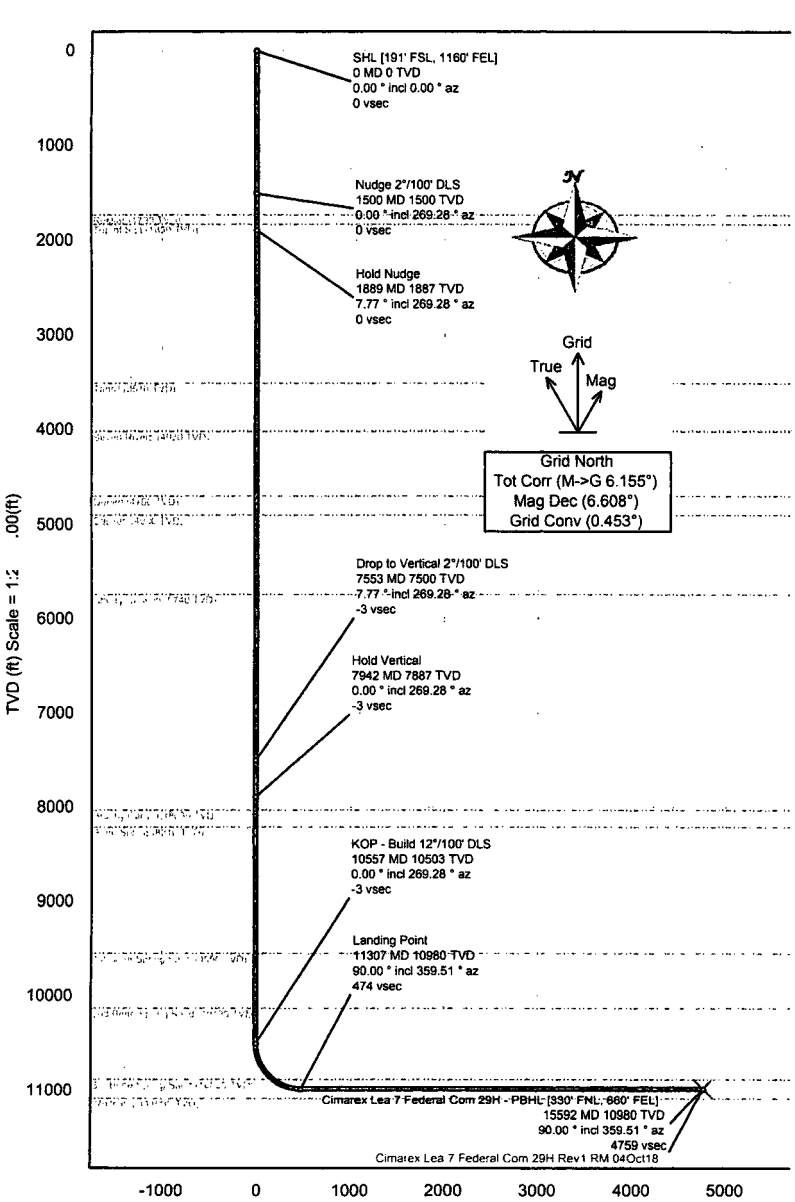
Model:	HDGM 2018	Dip:	60.511°	Date:	04-Oct-2018
MagDec:	6.608°	FS:	48139.112nT	Gravity FS:	998.506mgn (9.80665 Based)

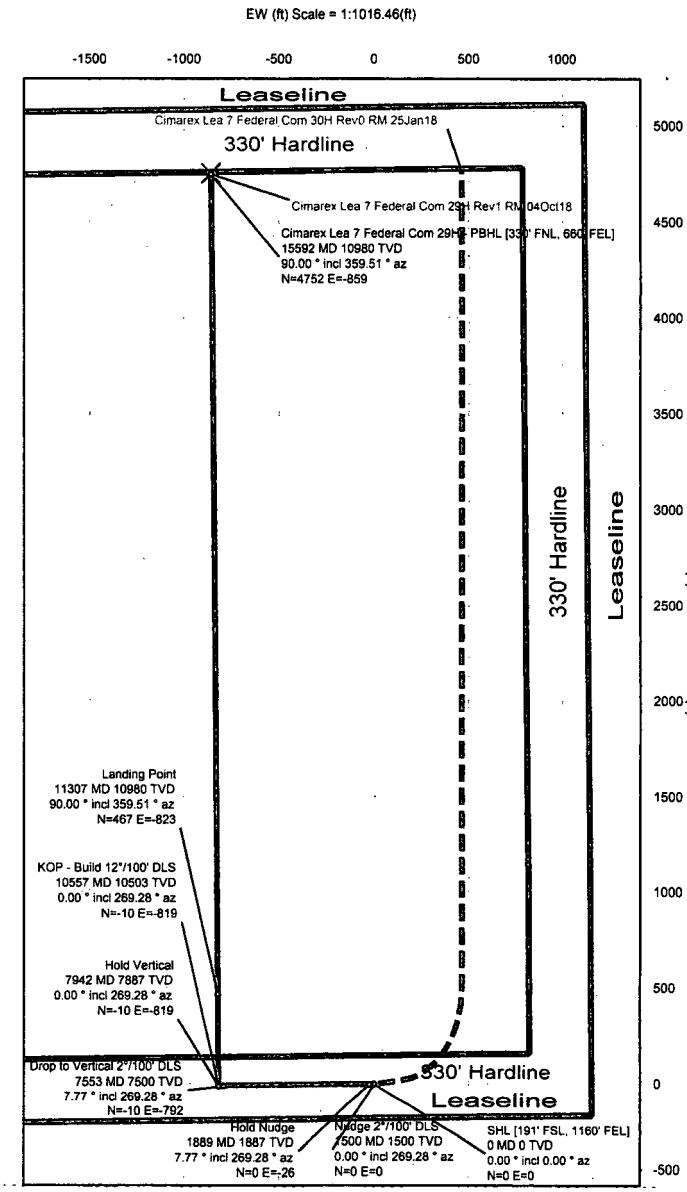
Surface Location NAD83 New Mexico State Plane, Eastern Zone, US Feet

Lat:	N 32 34 51.38	Northing:	576101.34ftUS	Grid Conv:	0.4532°
Lon:	W 103 29 30.49	Easting:	800547.3ftUS	Scale Fact:	0.99998604

Miscellaneous

Slot:	Cimarex Lea 7 Federal Com 29H	TVD Ref:	RKB(3702.4ft above MSL)
Plan:	Cimarex Lea 7 Federal Com 29H Rev1 RM 04Oct18		





Vertical Section (ft) Azim = 359.51° Scale = 1:2060.00(ft) Origin = 0N/-S, 0E/-W

Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [191' FSL, 1160' FEL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Nudge 2°/100' DLS	1500.00	0.00	269.28	1500.00	0.00	0.00	0.00	0.00
Rustler	1730.25	4.60	269.28	1730.00	-0.04	-0.12	-9.25	2.00
Top of Salt	1830.73	6.61	269.28	1830.00	-0.08	-0.24	-19.07	2.00
Hold Nudge	1888.58	7.77	269.28	1887.38	-0.11	-0.33	-26.31	2.00
Tansil	3526.23	7.77	269.28	3510.00	-1.00	-3.11	-247.74	0.00
Rivers	4040.96	7.77	269.28	4020.00	-1.29	-3.98	-317.34	0.00
Queen	4727.26	7.77	269.28	4700.00	-1.66	-5.15	-410.14	0.00
Capitan	4929.12	7.77	269.28	4900.00	-1.77	-5.49	-437.43	0.00
Cherry Canyon	5776.90	7.77	269.28	5740.00	-2.24	-6.93	-552.06	0.00
Drop to Vertical 2°/100' DLS	7553.22	7.77	269.28	7500.00	-3.21	-9.94	-792.24	0.00
Hold Vertical	7941.79	0.00	269.28	7887.38	-3.31	-10.27	-818.55	2.00
Canyon	8084.41	0.00	269.28	8030.00	-3.31	-10.27	-818.55	0.00
Bone Spring	8264.41	0.00	269.28	8210.00	-3.31	-10.27	-818.55	0.00
1st Bone Spring Sand	9604.41	0.00	269.28	9550.00	-3.31	-10.27	-818.55	0.00
2nd Bone Spring Sand	10184.41	0.00	269.28	10130.00	-3.31	-10.27	-818.55	0.00
KOP - Build 12°/100' DLS	10556.94	0.00	269.28	10502.54	-3.31	-10.27	-818.55	0.00
3rd Bone Spring Sand	10992.26	52.24	359.51	10880.00	181.76	174.79	-820.12	12.00
Landing Point	11306.94	90.00	359.51	10980.00	474.15	467.18	-822.61	12.00
Cimarex Lea 7 Federal Com 29H - PBHL [330' FNL, 660' FEL]	15591.69	90.00	359.51	10980.00	4758.90	4751.77	-859.02	0.00
Wolfcamp	NaN			11090.00				

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Cimarex Energy Company**
LEASE NO.:	**NMNM128835**
WELL NAME & NO.:	**Lea 7 Federal Com 29H**
SURFACE HOLE FOOTAGE:	**191'/S & 1160'/E**
BOTTOM HOLE FOOTAGE	**330'/N & 660'/E**
LOCATION:	**Section 7, T20S, R35E, NMPM**
COUNTY:	**Lea County, New Mexico**

COA

All previous COAs still apply expect the following:

H2S	◉ Yes	○ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	◉ Low	○ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☐ 4 String Area	☑ Capitan Reef	☐ WIPP

A. Hydrogen Sulfide

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Yates and Seven Rivers** formations. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **1780** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

   a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
   b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

   c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength,

whichever is greater.

d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Operator shall filled 1/3rd casing with fluid while running intermediate casing to maintain collapse safety factor.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
   - Cement to surface. If cement does not circulate see B.1.a, c-d above.

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:
(Use this for 3 string wells in the Capitan Reef, if 4 string well ensure FW based mud used across the capitan interval)

- Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.

- Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.

Operator shall filled 1/3rd casing with fluid while running intermediate casing to maintain collapse safety factor.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
   - Cement should tie-back at least 50 feet above the Capitan Reef **(Top of Capitan 4000')** into previous casing string. Operator shall provide method of verification. **Additional cement maybe required. Excess calculates to 3%.**

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

☒ Eddy County
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 393-3612

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on

which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log (one log per well pad is acceptable) run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the

formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
    e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

    b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

    c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.

    d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

    e. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

    f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes. This test shall be performed prior to the test at full stack pressure.

    g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

Waste Minimization Plan (WMP)

In the interest of resource development, submission of additional well gas capture development plan information is deferred but may be required by the BLM Authorized Officer at a later date.

ZS 101218

203507O SUNDRY LEA 7 FEDERAL COM 29H 30015 NMNM128835 CIMAREX ENERGY 12-55 438597 08292018 ZS

Cap KFC

13 3/8	surface csg in a	17 1/2	inch hole.		Design Factors		SURFACE	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	54.50	J 55	ST&C	5.30	1.39	0.9	1,780	97,010
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,134			Tail Cmt	does not	circ to sfc.	Totals:	1,780	97,010

Comparison of Proposed to Minimum Required Cement Volumes

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
17 1/2	0.6946	1094	1794	1291	39	8.80	1772	2M	1.56

Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK.

9 5/8	casing inside the	13 3/8			Design Factors		INTERMEDIATE	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	40.00	J 55	LT&C	2.27	0.85	0.77	5,720	228,800
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:						Totals:	5,720	228,800
The cement volume(s) are intended to achieve a top of				0	ft from surface or a		1780	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0.3132	1371	2420	1898	27	10.20	2718	3M	0.81

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.69, b, c, d
<0.70 a Problem!!

ALT. COLLAPSE SF: 0.85*1.5=1.27

5 1/2	casing inside the	9 5/8			Design Factors		PRODUCTION	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	17.00	L 80	LT&C	1.81	1.27	1.51	10,557	179,469
"B"	17.00	L 80	BUTT	5.10	1.10	1.51	5,035	85,595
w/8.4#/g mud, 30min Sfc Csg Test psig: 627						Totals:	15,592	265,064
B would be:				55.21	1.23	if it were a vertical wellbore.		

No Pilot Hole Planned	MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
	15592	10980	10980	10557	90	12	11307

The cement volume(s) are intended to achieve a top of 3950 ft from surface or a 1770 overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 3/4	0.2526	1512	2984	2961	1	9.00			1.35

Class 'H' tail cmt yld > 1.20

VERTICAL CURVE COLLAPSE SF IS TOO CONSERVATIVE.